

## Remarks

Before entry of the amendment, claims 15-24 are pending. After amendment, claims 25-40 are pending.

Most of the new claims recite language from claims as originally filed or as subsequently amended and are presented in new format for convenience. Support for language in the new claims can be found throughout the specification, as exemplified in the following table:

Claim No.	Language	Location in Specification
25	<p>"ion pair surfactant"</p> <p>(specific amino acids/ratios)</p> <p>"ion pairs between carboxyl anions...and amino group cations of the amino acid"</p>	<p>Para 0015</p> <p>Also, an alternative description (inherent) from combining a non-alkali salt form with alkali salt form</p> <p>Also, as compared with prior art para 2-4</p> <p>Para 32</p> <p>Para 15: an ion pair may be formed by aggregation of an anion deriving from a carboxyl group in an ....and an onium (sp) from an amino group .....</p>
26	(specific amino acid ratios)	Para 32
27	Alpha amino acid	Claim 3 originally filed
28	(amino acid forms)	Claim 4 originally filed
29	(amino acid forms)	Claim 5 originally filed
30	(amino acid forms)	Claim 7 originally filed
31	Emulsion	Claim 14 originally filed
32	Surfactant	Para 45, p. 18 para 2
33	"ion pair surfactant"	Para 0015

	(specific amino acids/ratios) "ion pairs between carboxyl anions...and amino group cations of the amino acid"	Also, an alternative description (inherent) from combining a non-alkali salt form with alkali salt form Also, as compared with prior art para 2-4 Para 32 Para 15: an ion pair may be formed by aggregation of an anion deriving from a carboxyl group in an ....and an onium (sp) from an amino group .....
34	(specific amino acid ratios)	Para 32
35	Alpha amino acid	Claim 3 originally filed
36	(amino acid forms)	Claim 4 originally filed
37	(amino acid forms)	Claim 5 originally filed
38	(amino acid forms)	Claim 7 originally filed
39	Emulsion	Claim 14 originally filed
40	Surfactant	Para 45, p. 18 para 2

Accordingly, new matter has not been added.

Applicant and applicant's attorney thank the Examiner for discussing this case. For greater clarity, and without wishing to be bound by any one theory for how an embodiment of the invention operates, applicant wishes to explain the invention as follows.

#### "The Claimed Invention"

1. As described in the background in paragraphs 2-4, previous art in this area recognized that the "popular soap" products commonly used and known as "alkali metal soap" "has some defects." As the specification explains, such soaps have

alkali metal ions as counter ions for the carboxylic acid groups on the soap. Also summarized in the background was an attempt to ameliorate this alkali counterion induced defect (the cited JP9-157688) by removal of the alkali counterion by combining as a salt with fatty acid. Note: the fatty acid has a carboxylic acid group that is protonated in its dry state and lacks an alkali counterion unless otherwise stated. Applicant has cited JP9-157688 as teaching the combination of fatty acid (see attached appendix figure 1) with an alkali cation (or organic cation) N-methyltaurate (para 3 of specification).

2. Without wishing to be bound by any one explanation for how the claimed invention works to achieve the unexpected result, applicant points out that the combination of long acyl derivative amino acid (acyl carbon chain from 8-24 carbons long for example) with a lack of enough alkali counterions, results in greater lathering, as ion pairing occurs between the two amino acid moieties themselves. See appendix figure 2. This is described in the examples and in the specification throughout. See for example paragraph 15, last 4 lines.

3. Applicant points out that each amino acid contains a carboxylic acid group (that is – charged) in water solution, such as between pH 5 and 9, and an amino group (that is + charged) in water solution, such as between pH 5 and 9. When in water, such charges form ion pairing with another charge. Typically, (most prior art cited by the Examiner specifically states this) every carboxylic acid – charge IS associated with an alkali metal cation (usually Na or K). As claimed, the invention avoids this prior art condition wherein all soap molecules have an alkali metal counterion. Such condition is not good for lathering, as applicant learned to appreciate.

4. Applicant points out that unfortunately, as briefly described in the background section of the specification, such “alkali metal salt” of a soap has

unfortunate limitations of insufficient lathering etc. In contradistinction to this prior art, applicant's invention provides 1) ion pairing between carboxylic acid – with + from the other amino acid (in place of alkali metal ion) (see for example, paragraph 15 last four lines) and this in combination with 2. (long acyl chain on one of the members) provides unexpectedly superior lathering. In this context, applicant notes that amphiphilic structures with long acyl (hydrophobic) chain at one end, with charge(s) at another end provide soap like qualities. The combination of: 1. at least some amino acids form ion pairs between them (by virtue of less than stoichiometric amounts of alkali metal for the combined carboxylic acid residues) and 2. specific long acyl chain amino acid structures, as claimed, give the unexpected benefit. Without wishing to be bound by any one theory for how the claimed invention works, applicant points out that the resultant amphiphilic complex is different and gives rise to a different kind of micelle.

5. Applicant points out that the acidic amino acids (both aspartic acid and glutamic acid are exemplified in the specification) have a second carboxylic acid group (total 2 – charges and one + charge) and that neutral amino acids are balanced zwitterions (one – charge and one + charge) in water between pH 5 and 9. Applicant further points out that a purified form of amino acid that lacks a counterion is protonated. A proton contributes the + charge. If water moisture is present, this proton is often characterized as  $H_3O^+$  or some equivalent of larger clusters such as  $H_7O_3^+$ . A single equivalent of minus charges available for ion pairing with an equivalent of positive charges becomes two equivalents when the amino acid becomes an acidic amino acid.

6. Applicant points out that the above scientific facts and nomenclature are well known to average skilled artisans having as background knowledge a minimum of a bachelors degree in biology or chemistry, and who use and retain

that knowledge by working in industry, or in education. Applicant desires not to burden the file history by submitting text books of common knowledge.

### **Rejections under 35 USC 112**

On page 3 of the office action, claims are rejected on alleged written description grounds in view of claim recitations "a protonated form", "if an acidic amino acid" and "if a neutral amino acid." The term "1.4 to 2 equivalents" relative to one equivalent also was rejected on the bottom of page 3.

In response, applicant points out that the recitations are adequately described as argued in note 5 above. Applicant thanks the Examiner for pointing out the description of 1.4 to 2 equivalents relative to two equivalents generally. Applicant argues however, that properly construed, "relative to the amino acid" was meant to include both equivalents of carboxylic acid (acidic amino acids have two carboxylic acids). The term "equivalents" refers to equivalent charges. Page 13 paragraph 0041 confirms this by restating "1.0 to 1.4 moles, relative to 1 mole of ...acylamino acid." The acylamino acid in the described embodiment has two equivalents of carboxylic acid (- charge) groups available for ion pairing, but on a mole basis, one mole of acidic amino acid is two equivalents of the negative charge in solution. Accordingly, the terms objected to are supported by the specification when read with the perspective of a skilled artisan.

This case is developing an expensive and tortured history over arguments that, in applicant's view are very simple and that represent unarguable black and white details of science. Thus, despite disagreeing with the Examiner on the written description grounds, and providing arguments based on unrefutable science, applicant has changed the words that the Examiner has objected to as alleged "new matter." The changes do not alter the meaning or scope of the

claims and are made merely to make the claims more clear. For example, "acidic amino acid" has been replaced with "first dicarboxylic N-C<sub>8-24</sub> acylamino acid." Applicant stresses that a skilled artisan reading the specification understands the true meanings and knows how many charged groups are in the respective moieties and knows the true meaning of the cited ratios in terms of the ability to form ion pairs. Accordingly, written description was met in the previous claim language and replacement of this language with words that are more acceptable to the Examiner does not change the breadth of the claims.

Claim 17 is rejected on page 4 of the office action for reciting "a-amino acids." In response, this has been amended to recite "alpha amino acids."

Reconsideration and removal of the 112 rejections is courteously requested.

**"The Invention Is: "**

Applicant continues to agree with the Examiner that numerous workers have prepared salts of amino acids and salts of acyl amino acids, and combined these in aqueous solutions. However, as stated before, this is not the claimed invention.

The claims have been amended to remove functional language that specified a limitation on ion pairing and now recite composition that have ion pairs between the amino acids. The specification teaches the significance of ion pairing and limitation of alkali metal counterions throughout. The specification teaches much detail on how to create the ion pairs and teaches desirable ratios.

Applicant obtained copies of the translated abstracts of the cited art, as copies of the cited art were not in the record. None of the cited art describe, either explicitly or inherently, ion pairing, or the condition of alkaline ion restriction for ion pairing in solution.

The English abstract of JP11180836 states “specific basic amino acid derivative (salt), and neutral amino acid (salt)....” This reference lacks the desirable claimed ratio of 1.0 to 1.6 equivalents. This reference also lacks a description of ion pairing. The possibility of ion pairing does not suffice for 102 anticipation and the guess or informed speculation, based on hindsight from applicant’s teaching does not show obviousness for this claim element.

The English abstract of JP7331281 describes “an N-acylglycine or its salt” and lacks any apprehension or description that ion pairing between amino acids or that combination of salt free form of N-acylglycine is desirable. The reference also lacks the claimed recitation of equivalent ratio.

The English abstract of JP11-323378 states that all amino acids are salts and lacks the recited ratios.

On page 6 of the office action, the JP11-323380 reference is asserted as teaching “N-acylamino acid salts...and one or more selected from acidic amino acids and salts thereof.” However, the claims recite ion pairs and specific ratios, which are lacking.

Because the references in combination lack a description of ion pairing, and lack a description of ratio of the selected amino acids, a prima facie case of obviousness is lacking. Reconsideration and removal of this rejection respectfully are requested.

If a telephone conversation can facilitate disposition of this case, the Examiner cordially is requested to contact the undersigned attorney at 202-742-6697.

Respectfully submitted,

A handwritten signature in black ink, reading "Marvin Motsenbocker", written over a horizontal line.

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